UNITED STATES PATENT AND TRADEMARK OFFICE

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte OFIR ZOHAR, YARON REVAH, HAIM HELMAN, and
DROR COHEN

_____

Appeal 2009-004591
Application 10/620,080[1]
Technology Center 2100

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Decided: June 25, 2010

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Before JOHN A. JEFFERY, JAMES D. THOMAS, and JAY P. LUCAS,
Administrative Patent Judges.

LUCAS, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal from a final rejection of claims 1 to 10 and 23 to 32 under authority of 35 U.S.C. § 134(a). The Board of Patent Appeals and Interferences (BPAI) has jurisdiction under 35 U.S.C. § 6(b). Claims 11 to 22 and 33 to 44 are withdrawn.

We reverse.

Appellants' invention relates to a method for redundantly storing data in an efficient manner (Spec. 5, ll. 3-4). In the words of Appellants:

> [A] data distribution system comprises a plurality of data storage devices wherein data blocks may be stored. The data blocks are stored at logical addresses that are assigned to the data storage devices according to a procedure which allocates the addresses among the devices in a manner that reduces the overhead incurred when a device is added to or removed from the system, and so as to provide a balanced access to the devices. . . . If a storage device is added to or removed from the system, the procedure reallocates the logical addresses between the new numbers of devices so that the balanced access is maintained. If a device has been added, the procedure only transfers addresses to the added storage device. . . . [T]he only transfers of data that occur are of data blocks stored at the transferred addresses. The procedure thus minimizes data transfer and associated management overhead when the number of storage devices is changed, or when the device configuration is changed.

(Spec. 5, ll. 5-27).

Claim 1 is exemplary and is reproduced below:

>1. A method for data distribution, comprising:
>
>>distributing logical addresses among an initial set of storage devices so as to provide a balanced access to the devices;
>
>>transferring the data to the storage devices in accordance with the logical addresses;
>
>>adding an additional storage device to the initial set, thus forming an extended set of the storage devices comprising the initial set and the additional storage device; and
>
>>redistributing the logical addresses among the storage devices in the extended set so as to cause a portion of the logical addresses to be transferred from the storage devices in the initial set to the additional storage device, while maintaining the balanced access and while maintaining the same logical addresses for the logical addresses in the initial set of storage devices that are not transferred to the additional storage device.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Jacobson   US 5,615,352   Mar. 25, 1997

David Karger *et al.* "Consistent Hashing and Random Trees: Distributed Caching Protocols for Relieving Hot Spots on the World Wide Web," 29th Assoc. for Comp. Machinery (ACM) Symp. on Theory of Computing, pp. 654-663 (1997) (hereinafter "Karger").

REJECTIONS

The Examiner rejects the claims as follows:

R1: Claims 1, 2, 5 to 10, 23, 24, and 27 to 32 stand rejected under
35 U.S.C. § 102(b) for being anticipated by Jacobson.

R2: Claims 3, 4, 25, and 26 stand rejected under 35 U.S.C. § 103(a) for
being obvious over Jacobson in view of Karger.

Appellants contend that the Jacobson reference does not anticipate the
claimed subject matter, and that Jacobson in combination with Karger, does
not render the claimed subject matter unpatentable because Jacobson fails to
teach the claim limitation "redistributing the logical addresses ... while
maintaining the same logical addresses for the logical addresses in the initial
set of storage devices that are not transferred to the additional storage
device." (App. Br. 6, top to middle; 8, bottom to 9, top). The Examiner
contends that each of the claims is properly rejected (Ans. 6, middle).

We will review the rejections in the order argued, and as grouped in
the Briefs. We have only considered those arguments that Appellants
actually raised in the Briefs. Arguments that Appellants could have made
but chose not to make in the Briefs have not been considered and are
deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

ISSUE

The issue is whether Appellants have shown that the Examiner erred
in rejecting the claims under 35 U.S.C. §§ 102(b) and 103(a). The issue
under 35 U.S.C. § 102(b) specifically turns on whether Appellants' claim

limitation "redistributing the logical addresses … while maintaining the
same logical addresses for the logical addresses in the initial set of storage
devices that are not transferred to the additional storage device" is the same
as Jacobson's teachings for "remapping" or "reconfiguring."

FINDINGS OF FACT

The record supports the following findings of fact (FF) by a
preponderance of the evidence.

Disclosure

1.   Appellants have invented a system and method for data distribution
that includes adding an additional storage device to an initial set of storage
devices to create an extended set of storage devices. (*See* claims 1 and 23.)
The invention, as claimed, further includes redistributing logical addresses
among storage devices in an extended set while maintaining the same logical
addresses for the logical addresses in the initial set of storage devices that
are not transferred to the additional storage device (claim 1).

Jacobson

2. The Jacobson reference teaches a system and method for redundant data
storage that involves adding a storage device to an initial set of storage
devices to create an extended set of storage devices. (*See* col. 3, ll. 1-3.)
Jacobson teaches reconfiguring into an expanded "stripe" for storing a
predetermined amount of data (col. 2, ll. 16-17). The expanded "stripe"
spans across all storage disks, including the new storage disks (*id.* at ll.
18-19). Virtual storage spaces are updated and physical storage spaces
remapped (col. 3, ll. 4-7).

Karger

3. The Karger reference discloses consistent hashing, a method that maintains a balanced load across hashes (Section 4, "Consistent Hashing").

PRINCIPLES OF LAW

Appellants have the burden on appeal to the Board to demonstrate error in the Examiner's position. *See In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006).

> [U]nless a reference discloses within the four corners of the document not only all of the limitations claimed *but also all of the limitations arranged or combined in the same way as recited in the claim*, it cannot be said to prove prior invention of the thing claimed and, thus, cannot anticipate under 35 U.S.C. § 102.

Net MoneyIN, Inc. v. VeriSign et al., 545 F.3d 1359, 1371 (Fed. Cir. 2008) (emphasis added).

ANALYSIS
*Argument with respect to the rejection
of claims 1, 2, 5 to 10, 23, 24, and 27 to 32
under 35 U.S.C. § 102(b) [R1]*

The Examiner finds that Jacobson teaches Appellants' claim limitation "redistributing the logical addresses … while maintaining the same logical addresses for the logical addresses in the initial set of storage devices that are not transferred to the additional storage device" in column 2 at lines 9 to 25 (Final Rej. 5, mailed October 16, 2006). The Examiner states

in the Answer that it would be apparent that Jacobson's application level virtual storage address (cited as Appellants' claimed "logical addresses") remains constant for the set of data stripes that was not moved to the newly added storage drive (Ans. 6, top).

In reply, Appellants contend:

> Jacobson ... does NOT teach that <u>only</u> data that
> needs to be moved to a new disk is actually
> transferred. [Jacobson's data] is moved when
> storage disks are added to the system, and there is
> no [teaching] that the 'another portion of the
> physical disk storage space' [in Jacobson] is
> limited in any way to the new storage disk.
> Therefore ... Jacobson [is not] [']maintaining the
> same logical addresses for the logical addresses in
> the initial set of storage devices that are not
> transferred to the additional storage device,['] as
> recited in claim 1.

(App. Br. 6, top to middle) (emphasis added).

We find persuasive Appellants' above-stated argument and dispositive of the issues presented on appeal. We find that Appellants have invented a system and method for data distribution that includes adding an additional storage device to an initial set of storage devices to create an extended set of storage devices (FF#1). The invention, as claimed, further includes redistributing logical addresses among storage devices in an extended set while maintaining the same logical addresses for the logical addresses in the initial set of storage devices that are not transferred to the additional storage device (*id.*). In contrast, the Jacobson reference teaches a system and method for redundant data storage that involves adding a storage device to an initial set of storage devices to create an extended set of storage devices.

Jacobson teaches reconfiguring into an expanded "stripe" for storing a predetermined amount of data (FF#2). The expanded "stripe" spans across all storage disks, including the new storage disks. Virtual storage spaces are updated and physical storage spaces remapped (*id.*).

Nowhere in Jacobson is there any teaching that Jacobson's steps of "reconfiguring" or "remapping" either explicitly or implicitly involve "maintaining the same logical addresses for the logical addresses in the initial set of storage devices that are not transferred to the additional storage device," as recited in Appellants' claim 1. In the "Response to Arguments" section of the Answer, the Examiner offers explanatory drawings of the proposed reading of Jacobson "to clearly illustrate how the logical addresses would remain the same for data stripes that were not moved." (Ans. 5, middle). Further, without citation, the Examiner reaches the conclusion that "even if we were to consider that the data is being moved within the initial set, it would be apparent that the logical addresses (Application level virtual storage address) remain constant for the set of data stripes that was [sic] not moved." (Ans. 6, top). However, we find no grounding for that conclusion in the four corners of the Jacobson reference, *see Net MoneyIN, Inc. v. VeriSign*, cited above, supporting the Examiner's statements on the record (*id.*). In light of the lack of support for the Examiner's findings and in accordance with the teachings of *Net MoneyIN, Inc.*, we find error in the rejection of claim 1.

*Argument with respect to the rejection
of claims 3, 4, 25, and 26
under 35 U.S.C. § 102(b) [R2]*

The Examiner relied upon Jacobson to provide the essential teaching of "redistributing the logical addresses ... while maintaining the same logical addresses for the logical addresses in the initial set of storage devices that are not transferred to the additional storage device," as recited in claim 1. Since we found above that the base reference Jacobson is deficient (*see supra*), we necessarily find error in the rejection [R2] of dependent claims 3, 4, 25, and 26.

CONCLUSION OF LAW

Based on the findings of facts and analysis above, we conclude that the Examiner erred in rejecting claims 1 to 10 and 23 to 32.

DECISION

We reverse the Examiner's rejections [R1 and R2] of claims 1 to 10 and 23 to 32.

REVERSED

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